

SEQUENCE LISTING

<110> Kovacs, et al.

<120> Identification of a region of the major surface glycoprotein (MSG) gene of human *Pneumocystis carinii*

<130> 4239-66050

<150> 09/762,724
<151> 2001-09-02

<150> PCT/US99/18750
<151> 1999-08-17

<150> US 60/096,805
<151> 1998-08-17

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<170> PatentIn Ver. 2.0

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Val Pro Glu Cys Asp Glu Leu Ala Glu Lys Cys Gly Lys Glu Asn Ile	
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Val Tyr Met His Pro Gly Ser Asp Phe Asp Pro Thr Lys Pro Glu Pro		
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Thr Leu Ala Glu Asp Ile Gly Leu Glu Leu Tyr Lys Arg Ala Glu		
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Glu Trp Gly Lys Leu Pro Thr Phe Leu Ser Asp Glu Asp Cys Ala Lys		
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gat gat cgt ttt tct ttt gta tgt gtt ttc caa aac gct aca tgt gag Asp Asp Arg Phe Ser Phe Val Cys Val Phe Gln Asn Ala Thr Cys Glu 610 615 620	1872
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Asn Ala Gly Leu Asn Pro Glu Lys Val His Glu Lys Leu Lys Asp Phe			
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Cys Asp Asn Gly Lys Arg Asn Glu Lys Cys Gln Asp Leu Lys Asn Lys			
65	70	75	80
Val Asn Gln Lys Cys Ile Lys Phe Gln Gly Lys Leu Gln Thr Ala Ala			
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Gly Lys Lys Ile Ser Glu Leu Thr Asp Glu Asp Cys Lys Lys Asn Glu			
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Gln Gln Cys Leu Phe Leu Glu Gly Ala Cys Pro Thr Glu Leu Lys Asp			
115	120	125	
Asp Cys Asn Lys Leu Arg Asn Asn Cys Tyr Gln Lys Glu Arg Asn Asn			
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Val Ala Glu Glu Val Leu Leu Arg Ala Leu Arg Gly Asp Leu Asn Glu			
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Thr Lys Thr Cys Glu Lys Lys Leu Lys Glu Val Cys Pro Lys Leu Glu			
165	170	175	
Arg Glu Ser Asp Glu Leu Thr Glu Leu Cys Leu Tyr Gln Lys Thr Thr			
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Cys Val Ser Leu Val Thr Lys Gly Lys Ser Lys Cys Asp Thr Leu Glu			
195	200	205	
Lys Glu Val Glu Glu Ala Leu Lys Lys Asn Glu Leu Arg Glu Lys Cys			
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 Asp Lys Ser Lys Cys Asn Lys Pro Asn Asn Lys Asp Cys Lys Glu Tyr
 245 250 255
 Val Pro Glu Cys Asp Glu Leu Ala Glu Lys Cys Gly Lys Glu Asn Ile
 260 265 270
 Val Tyr Met His Pro Gly Ser Asp Phe Asp Pro Thr Lys Pro Glu Pro
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 Thr Leu Ala Glu Asp Ile Gly Leu Glu Glu Leu Tyr Lys Arg Ala Glu
 290 295 300
 Glu Asp Gly Ile Phe Val Gly Arg Gln His Val Arg Asp Ala Thr Ala
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 Lys Ala Leu Lys Lys Asn Cys Glu Asn Pro His Glu His Glu Ala Leu
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 Cys Asp Glu Leu Glu Lys Asp Val Asn Lys Thr Cys Thr Ser Leu Thr
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 Ser Thr Ile Leu Lys Asn Arg Leu Tyr Ile Ser Pro Asp Gly Ile Ala
 385 390 395 400
 Glu Trp Gly Lys Leu Pro Thr Phe Leu Ser Asp Glu Asp Cys Ala Lys
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 Glu Ala Cys Met Asn Val Arg Ala Ala Cys Tyr Lys Arg Gly Leu Asp
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 Ala Arg Ala Asn Ser Val Leu Gln Lys Asn Met Arg Gly Leu Leu His
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 Gly Ser Asn Lys Asp Trp Leu Lys Lys Phe Gln Gln Glu Leu Ala Lys
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 Val Cys Glu Lys Leu Lys Gly Asn Lys Gly Ser Phe Ser Asn Asp Glu
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 His His His Gln Met Arg Val Ile Phe Leu Arg Gln Gln Leu Asp Gln
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 Lys Arg Asp Phe Pro Thr Asp Lys Asp Cys Lys Glu Leu Gly Arg Lys
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Cys Gln Asp Leu Gly Lys Asp Ser Lys Glu Ile Thr Trp Pro Cys His
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 Thr Leu Glu Gln Gln Cys Asn Arg Leu Gly Ile Thr Glu Ile Leu Lys
 565 570 575
 Gln Ile Leu Leu Asp Glu His Lys Asp Thr Leu Lys Ser His Glu Asn
 580 585 590
 Cys Ala Lys Tyr Leu Lys Arg Lys Cys His Lys Trp Ser Arg Arg Gly
 595 600 605
 Asp Asp Arg Phe Ser Phe Val Cys Val Phe Gln Asn Ala Thr Cys Glu
 610 615 620
 Leu Met Val Lys Asp Val Gln Asp Arg Cys Lys Ile Phe Glu Glu Asn
 625 630 635 640
 Met Gln Ala Ser Asp Ile Asn Asp Ser Leu Lys Lys Asn Gln Ile Lys
 645 650 655
 Ala Glu Ser Ala Ala Asn Ile Cys Pro Ser Trp His Pro Tyr Cys Asp
 660 665 670
 Arg Phe Leu Pro Asn Cys Pro Asp Leu Lys Lys Gly Lys Thr Phe Cys
 675 680 685
 Gln Asn Leu Lys Lys Tyr Cys Glu Pro Phe Tyr Lys Arg Lys Val Leu
 690 695 700
 Glu Asp Ala Leu Lys Val Glu Leu Arg Gly Asn Leu Ser Asn Ile Thr
 705 710 715 720
 Lys Cys Glu Pro Ala Leu Glu Arg Tyr Cys Thr Val Leu Lys Asp Val
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 Asn Asn Ala Ser Ile Ser Ser Leu Cys Lys Asp Asn Thr Glu Ser Lys
 740 745 750
 Thr Lys Lys Ala Asp Asn Lys Asn Val Arg Lys Lys Leu Cys Leu Lys
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 Thr Glu Leu Glu Lys Ser Leu Lys Lys Asp Val Lys Thr Tyr Glu Glu
 785 790 795 800
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 Ser Leu Val Lys Lys Asn Glu Ser Asn Thr Ser Lys Asn Asn Ser Lys
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 835 840 845
 Tyr Val Lys Ile Leu Arg Arg Gly Val Lys Glu Ala Leu Val Thr Glu
 850 855 860

Ser Glu Ala Lys Ala Phe Asp Leu Ala Ala Glu Val Phe Gly Arg Tyr
865 870 875 880

Val Asp Leu Lys Glu Lys Cys Glu Lys Leu Thr Ser Asp Cys Gly Ile
885 890 895

Lys Asp Asp Cys Asp Gly Leu Lys Glu Val Cys Gly Lys Ile Glu Lys
900 905 910

Thr Cys His Asp Leu Lys Pro Leu Glu Val Lys Ser His Glu Ile Val
915 920 925

Thr Glu Ser Thr Thr Thr Thr Thr Thr Thr Val Thr Asp
930 935 940

Pro Lys Ala Thr Glu Cys Lys Ser Leu Gln Thr Thr Asp Thr Trp Val
945 950 955 960

Thr Gln Thr Ser Thr His Thr Ser Thr Thr Ile Thr Ser Thr Ile
965 970 975

Thr Ser Lys Ile Thr Leu Thr Ser Thr Arg Arg Cys Lys Pro Thr Lys
980 985 990

Cys Thr Thr Gly Asp Glu Ala Gly Asp Val Lys Pro Ser Glu Gly Leu
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Asp Glu Glu His Val Leu Ala Leu Ile Leu Lys Lys Asn Gly Leu Glu
20 25 30

gat aca aaa tgc aaa act aag ttg gaa gaa tat tgc aaa aca tta aca 144
Asp Thr Lys Cys Lys Thr Lys Leu Glu Tyr Cys Lys Thr Leu Thr
35 40 45

aat gca gga tta aat cca gaa aaa gtt cac gaa aaa tta aaa gat ttc 192
Asn Ala Gly Leu Asn Pro Glu Lys Val His Glu Lys Leu Lys Asp Phe
50 55 60

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Leu Leu Ala Leu Leu Lys Lys Thr Leu Lys Lys Glu Glu Cys Ile			
325	330	335	
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Lys Ala Leu Lys Lys Asn Cys Glu Asn Pro His Glu His Glu Ala Leu			
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Cys Asp Glu Leu Glu Lys Asp Val Asn Lys Thr Cys Thr Ser Leu Thr			
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Ser Thr Ile Leu Lys Asn Arg Leu Tyr Ile Ser Pro Asp Gly Ile Ala			
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Phe Met Ile
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Gln Gln Cys Leu Phe Leu Glu Gly Ala Cys Pro Thr Glu Leu Lys Asp
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Asp Cys Asn Lys Leu Arg Asn Asn Cys Tyr Gln Lys Glu Arg Asn Asn
130 135 140

Val Ala Glu Glu Val Leu Leu Arg Ala Leu Arg Gly Asp Leu Asn Glu
145 150 155 160

Thr Lys Thr Cys Glu Lys Lys Leu Lys Glu Val Cys Pro Lys Leu Glu
165 170 175

Arg Glu Ser Asp Glu Leu Thr Glu Leu Cys Leu Tyr Gln Lys Thr Thr
180 185 190

Cys Val Ser Leu Val Thr Lys Gly Lys Ser Lys Cys Asp Thr Leu Glu
195 200 205

Lys Glu Val Glu Glu Ala Leu Lys Lys Asn Glu Leu Arg Glu Lys Cys
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Leu Leu Leu Glu Glu Gln Cys Tyr Phe His Arg Gly Asn Cys Glu Gly
225 230 235 240

Asp Lys Ser Lys Cys Asn Lys Pro Asn Asn Lys Asp Cys Lys Glu Tyr
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Val Pro Glu Cys Asp Glu Leu Ala Glu Lys Cys Gly Lys Glu Asn Ile
260 265 270

Val Tyr Met His Pro Gly Ser Asp Phe Asp Pro Thr Lys Pro Glu Pro
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 Thr Leu Ala Glu Asp Ile Gly Leu Glu Glu Leu Tyr Lys Arg Ala Glu
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 Glu Asp Gly Ile Phe Val Gly Arg Gln His Val Arg Asp Ala Thr Ala
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 Lys Ala Leu Lys Lys Asn Cys Glu Asn Pro His Glu His Glu Ala Leu
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 Glu Trp Gly Lys Leu Pro Thr Phe Leu Ser Asp Glu Asp Cys Ala Lys
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 Glu Ala Cys Met Asn Val Arg Ala Ala Cys Tyr Lys Arg Gly Leu Asp
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 Ala Arg Ala Asn Ser Val Leu Gln Lys Asn Met Arg Gly Leu Leu Arg
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 Gly Ser Asn Gln Ser Trp Leu Lys Glu Phe Gln Gln Arg Leu Val Lys
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 Val Cys Lys Glu Leu Lys Glu Asn Lys Gly Ser Phe Pro Asn Asp Glu
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 Ile Phe Val Leu Cys Val Gln Pro Ala Lys Ala Ala Arg Leu Leu Thr
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 His Asp His Gln Met Arg Val Thr Phe Leu Arg Gln Gln Leu Asp Gln
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 Gln Val Leu Leu Asp Glu His Lys Asp Thr Leu Lys Asp Gln Glu Ser
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Cys Val Lys Tyr Leu Lys Glu Lys Cys Asn Lys Trp Ser Arg Arg Gly
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 Asp Asp Arg Phe Ser Phe Val Cys Val Phe Gln Asn Ala Thr Cys Glu
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 Ile Lys Ala Ser Tyr Ile Ile Glu Phe Leu Glu Asn Asn Thr Asn Lys
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 Ile Thr Thr Leu Glu Arg Asn Cys Pro Ser Trp His Thr Tyr Cys Asn
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Gly Thr Thr Thr Thr Thr Thr Thr Thr Val Ala Asp Pro Lys
930 935 940

Ala Thr Glu Cys Lys Ser Leu Gln Thr Thr Asp Thr Trp Val Thr Gln
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Thr Ser Thr His Thr Ser Thr Ser Thr Ile Thr Ser Thr Ile Thr Ser
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Lys Ile Thr Leu Thr Ser Thr Arg Arg Cys Lys Pro Thr Lys Cys Thr
980 985 990

Thr Gly Asp Asp Ala Glu Asp Val Lys Pro Ser Glu Gly Leu Arg Val
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Val Tyr Asp Gly Glu Glu Ile Leu Leu Ala Leu Ile Ala Gly Lys Lys
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tat aat gat aat gaa tgc aaa aaa gaa tta gaa aaa tat tgt aag aca 144
Tyr Asn Asp Asn Glu Cys Lys Lys Glu Leu Glu Lys Tyr Cys Lys Thr
35 40 45

tta acg gat gca gaa tta aaa cca gaa aaa gtt cac aaa aaa ctt aag 192
Leu Thr Asp Ala Glu Leu Lys Pro Glu Lys Val His Lys Lys Leu Lys
50 55 60

gag ttt tgt gaa aat aaa aaa gca gat tca aaa tgc aaa gaa ctg aaa 240
Glu Phe Cys Glu Asn Lys Lys Ala Asp Ser Lys Cys Lys Glu Leu Lys
65 70 75 80

gaa aaa ctc act caa aaa tgt act gca atc aaa gga aaa ctt aca gaa 288
Glu Lys Leu Thr Gln Lys Cys Thr Ala Ile Lys Gly Lys Leu Thr Glu
85 90 95

gca atc aaa aaa aaa aat tca gat tta acg gat gaa gat tgc aaa gag Ala Ile Lys Lys Lys Asn Ser Asp Leu Thr Asp Glu Asp Cys Lys Glu 100 105 110	336
aat gaa caa caa tgc cta ttt ttg gag gga gca tgt cca gcg gaa ctt Asn Glu Gln Gln Cys Leu Phe Leu Glu Gly Ala Cys Pro Ala Glu Leu 115 120 125	384
aaa gat gat tgc aat act ttg aga aat aag tgc tat caa aag aag cgt Lys Asp Asp Cys Asn Thr Leu Arg Asn Lys Cys Tyr Gln Lys Lys Arg 130 135 140	432
gat aaa gtg gcg gaa gaa gct ctt tta aga gca gtt cgt gga ggt cta Asp Lys Val Ala Glu Ala Leu Leu Arg Ala Val Arg Gly Gly Leu 145 150 155 160	480
atc aat gaa act aca tgt gaa gga aag ctc aaa gag gtt tgc ata gag Ile Asn Glu Thr Thr Cys Glu Gly Lys Leu Lys Glu Val Cys Ile Glu 165 170 175	528
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atg acg tgc aaa aca ttt gta tta gaa aaa caa aaa aaa tgt aat gct Met Thr Cys Lys Thr Phe Val Leu Glu Lys Gln Lys Lys Cys Asn Ala 195 200 205	624
ctt aaa cag gat gtt aac gca gca ctt gag aag aaa gat gag tta cga Leu Lys Gln Asp Val Asn Ala Ala Leu Glu Lys Lys Asp Glu Leu Arg 210 215 220	672
gga aaa tgt tta cca ctg ctt gaa cga tgc tat ttt tat aga ggg aat Gly Lys Cys Leu Pro Leu Leu Glu Arg Cys Tyr Phe Tyr Arg Gly Asn 225 230 235 240	720
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cct act gta gca gaa gac ata gga ctg gaa gag ctt tat aaa aag gcc Pro Thr Val Ala Glu Asp Ile Gly Leu Glu Leu Tyr Lys Lys Ala 290 295 300	912
gca gaa gaa ggt gtt cat att gga aag cct cct gta aga gat gca act Ala Glu Glu Gly Val His Ile Gly Lys Pro Pro Val Arg Asp Ala Thr 305 310 315 320	960
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agt cat gaa att ttg gga gat ttt tgt aat caa aat gta gct ggt caa Ser His Glu Ile Leu Gly Asp Phe Cys Asn Gln Asn Val Ala Gly Gln 355 360 365	1104
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cct ctt gac aaa gaa tgt aat aat ctg aag gca gca tgt tat aag aga Pro Leu Asp Lys Glu Cys Asn Asn Leu Lys Ala Ala Cys Tyr Lys Arg 435 440 445	1344
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cgt ttc tct ttt gta tgt gtt tac caa aac gct acg tgt aag ctg ata Arg Phe Ser Phe Val Cys Val Tyr Gln Asn Ala Thr Cys Lys Leu Ile 610 615 620	1872
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tta ccc aat tgt cct gat ctt aag aaa gga aaa act ttc tgt caa aat Leu Pro Asn Cys Pro Asp Leu Lys Lys Gly Lys Thr Phe Cys Gln Asn 675 680 685	2064
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Glu Phe Cys Glu Asn Lys Lys Ala Asp Ser Lys Cys Lys Glu Leu Lys
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Glu Lys Leu Thr Gln Lys Cys Thr Ala Ile Lys Gly Lys Leu Thr Glu
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Ala Ile Lys Lys Lys Asn Ser Asp Leu Thr Asp Glu Asp Cys Lys Glu
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Asn Glu Gln Gln Cys Leu Phe Leu Glu Gly Ala Cys Pro Ala Glu Leu
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Lys Asp Asp Cys Asn Thr Leu Arg Asn Lys Cys Tyr Gln Lys Lys Arg
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Gly Lys Cys Leu Pro Leu Leu Glu Arg Cys Tyr Phe Tyr Arg Gly Asn
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Cys Glu Asp Ile Ser Lys Cys Asn Lys Ser Ser Glu Asp Cys Tyr Glu
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Tyr Leu Pro Val Cys Asp Thr Leu Ala Val Lys Cys Glu Glu Asn Lys
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 675 680 685
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 Ser Ser Ile Asn Ser Leu Cys Lys Asp Asn Thr Glu Ser Lys Thr Lys
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 Lys Thr Asp Asn Glu Val Arg Lys Lys Leu Cys Leu Lys Leu Val Glu
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 Glu Lys Asp Leu Lys Asp Asp Phe Glu Thr Phe Glu Lys Leu Lys Lys
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 Gln Ala Glu Lys Thr Met Asn Lys Ser Asn Leu Val Leu Ser Phe Val
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 Ile Leu Arg Arg Gly Val Lys Asp Val Ser Val Thr Glu Ser Glu Ala
 850 855 860
 Lys Ala Phe Asp Leu Val Ala Glu Val Phe Gly Arg Tyr Leu Asp Leu
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 Lys Glu Arg Cys Asn Lys Leu Glu Ser Asp Cys Arg Val Lys Glu Asp
 885 890 895
 Cys Lys Asp Leu Glu Gly Val Cys Gly Lys Ile Gln Gly Val Cys Ser
 900 905 910
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 915 920 925
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 945 950 955 960
 Ser Thr His Thr Ser Thr Ser Thr Ile Thr Ser Thr Ile Thr Ser Lys
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Asp Glu Val Asn Ile Leu Ala Leu Ile Leu Gln Glu Asp Ala Met Glu
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gat aca aaa tgc aaa aaa agt tta gaa aaa tac tgc gaa gag ttg aaa 144
Asp Thr Lys Cys Lys Ser Leu Glu Lys Tyr Cys Glu Glu Leu Lys
35 40 45

aaa gca tca cta gac atg gaa aaa gta cat aaa atg ctt aaa gat ttc 192
Lys Ala Ser Leu Asp Met Glu Lys Val His Lys Met Leu Lys Asp Phe
50 55 60

tgt gga aat ggg aaa gca agt aaa gca aat aca aaa tgt caa ggt cta 240
Cys Gly Asn Gly Lys Ala Ser Lys Ala Asn Thr Lys Cys Gln Gly Leu
65 70 75 80

caa gcc aaa gtt acg ggg aaa tgt aca aat ttt aaa aca caa aag cta 288
Gln Ala Lys Val Thr Gly Lys Cys Thr Asn Phe Lys Thr Gln Lys Leu
85 90 95

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Gly Pro Ala Leu Thr Asn Pro Ser Asp Asp Asn Cys Lys Glu Ser Glu
100 105 110

cga caa tgc cta ttt ttg gag gga gca tgc cat aat ctt gta gaa gat 384
Arg Gln Cys Leu Phe Leu Glu Gly Ala Cys His Asn Leu Val Glu Asp
115 120 125

tgt aac aaa cta agg aat cta tgt tac cag aaa aaa cgt gac gga gta 432
Cys Asn Lys Leu Arg Asn Leu Cys Tyr Gln Lys Lys Arg Asp Gly Val
130 135 140

gca gaa gaa gtc ctt ttg agg gca ctt cgt agt gat ctc aat aaa aca 480
Ala Glu Glu Val Leu Leu Arg Ala Leu Arg Ser Asp Leu Asn Lys Thr
145 150 155 160

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165	170	175	
gaa agt aat gaa tta acg gac ttg ttt ttg aac cag aaa aag acg tgc	576		
Glu Ser Asn Glu Leu Thr Asp Leu Cys Leu Asn Gln Lys Lys Thr Cys			
180	185	190	
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Glu Asn Ile Ile Lys Glu Lys Asp Lys Lys Cys Thr Thr Leu Lys Ala			
195	200	205	
aat gtt gca aca gca ctt gga agt ttt aaa aaa gaa ata tgc ctt gaa	672		
Asn Val Ala Thr Ala Leu Gly Ser Phe Lys Lys Glu Ile Cys Leu Glu			
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Leu Leu Glu Gln Cys Tyr Phe Tyr Ile Gly Asn Cys Gly Asp Asp Asp			
225	230	235	240
ata att aaa tgt att gaa ttg gga ggg aaa tgc caa gaa caa aac att	768		
Ile Ile Lys Cys Ile Glu Leu Gly Gly Lys Cys Gln Glu Gln Asn Ile			
245	250	255	
gtt tat ata cca cca gga ccc gat ttt gat cca act aga cca gag gct	816		
Val Tyr Ile Pro Pro Gly Pro Asp Phe Asp Pro Thr Arg Pro Glu Ala			
260	265	270	
aca cta gca gag gac ata gac ctg gat gag ctt tat aaa aag gca gaa	864		
Thr Leu Ala Glu Asp Ile Asp Leu Asp Glu Leu Tyr Lys Lys Ala Glu			
275	280	285	
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Glu Asp Gly Val Phe Ile Gly Lys His His Leu Arg Asp Ala Thr Ala			
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Leu Leu Thr Leu Leu Val Lys Lys Asp Asp Thr Gly Lys Asn Asn Asn			
305	310	315	320
atc gga gaa aaa tgc aat aag att ctc gaa gat aaa tgc aaa aac tct	1008		
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325	330	335	
caa cag cat gaa gct cta aaa aat tta tgt aat aat aat aat aat cct aat	1056		
Gln Gln His Glu Ala Leu Lys Asn Leu Cys Asn Asn Asn Ser Pro Asn			
340	345	350	
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Pro Asn Asp Lys Ile Val Glu Trp Arg Lys Leu Pro Thr Phe Leu Thr			
385	390	395	400

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tgg cat acg tat tgc aat aga ttt tca cct aat tgt cca ggt ctt acg Trp His Thr Tyr Cys Asn Arg Phe Ser Pro Asn Cys Pro Gly Leu Thr 660 665 670	2016
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Lys Ala Ser Leu Asp Met Glu Lys Val His Lys Met Leu Lys Asp Phe 50 55 60	
Cys Gly Asn Gly Lys Ala Ser Lys Ala Asn Thr Lys Cys Gln Gly Leu 65 70 75 80	
Gln Ala Lys Val Thr Gly Lys Cys Thr Asn Phe Lys Thr Gln Lys Leu 85 90 95	

Gly Pro Ala Leu Thr Asn Pro Ser Asp Asp Asn Cys Lys Glu Ser Glu
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 Arg Gln Cys Leu Phe Leu Glu Gly Ala Cys His Asn Leu Val Glu Asp
 115 120 125
 Cys Asn Lys Leu Arg Asn Leu Cys Tyr Gln Lys Lys Arg Asp Gly Val
 130 135 140
 Ala Glu Glu Val Leu Leu Arg Ala Leu Arg Ser Asp Leu Asn Lys Thr
 145 150 155 160
 Glu Thr His Glu Lys Lys Leu Lys Glu Ile Cys Pro Val Leu Gln Arg
 165 170 175
 Glu Ser Asn Glu Leu Thr Asp Leu Cys Leu Asn Gln Lys Lys Thr Cys
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 Glu Asn Ile Ile Lys Glu Lys Asp Lys Lys Cys Thr Thr Leu Lys Ala
 195 200 205
 Asn Val Ala Thr Ala Leu Gly Ser Phe Lys Lys Glu Ile Cys Leu Glu
 210 215 220
 Leu Leu Glu Gln Cys Tyr Phe Tyr Ile Gly Asn Cys Gly Asp Asp Asp
 225 230 235 240
 Ile Ile Lys Cys Ile Glu Leu Gly Gly Lys Cys Gln Glu Gln Asn Ile
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 Val Tyr Ile Pro Pro Gly Pro Asp Phe Asp Pro Thr Arg Pro Glu Ala
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 Thr Leu Ala Glu Asp Ile Asp Leu Asp Glu Leu Tyr Lys Lys Ala Glu
 275 280 285
 Glu Asp Gly Val Phe Ile Gly Lys His His Leu Arg Asp Ala Thr Ala
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 Met Arg Gly Leu Leu Arg Gly Ser Asn Gln Ser Trp Leu Lys Glu Phe
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 Lys Trp Ser Arg Arg Gly Asp Asp Arg Phe Ser Phe Val Cys Val Phe
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 Glu Val Phe Lys Lys Asn Ile Lys Ala Ser Tyr Ile Ile Glu Phe Leu
 625 630 635 640
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 645 650 655
 Trp His Thr Tyr Cys Asn Arg Phe Ser Pro Asn Cys Pro Gly Leu Thr
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 Lys Glu Asn Ser Cys Thr Lys Ile Lys Lys His Cys Glu Pro Phe Tyr
 675 680 685
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 740 745 750
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 Phe Gly Arg Tyr Val Asp Leu Lys Glu Arg Cys Asn Lys Leu Glu Ser
 865 870 875 880
 Asp Cys Arg Ile Lys Glu Asp Cys Lys Asp Leu Glu Glu Val Cys Lys
 885 890 895
 Lys Ile Asn Lys Ala Cys Arg Asn Leu Lys Pro Leu Glu Val Lys Pro
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 His Glu Thr Val Thr Glu Ser Thr Thr Thr Thr Thr Thr Thr Thr
 915 920 925
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 Asp Thr Trp Val Thr Gln Thr Ser Thr His Thr Ser Thr Ser Thr Ile
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Asp	Glu	Glu	His	Val	Leu	Ala	Leu	Ile	Leu	Lys	Glu	Asp	Gly	Leu	Ser	96
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				20												

gag cag gaa tgc aaa aaa aaa cta aaa aaa tat tgc caa gaa ttg act

Glu	Gln	Glu	Cys	Lys	Lys	Leu	Lys	Lys	Tyr	Cys	Gln	Glu	Leu	Thr	144
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Ile	Glu	Lys	Cys	Thr	Thr	Ile	Lys	Gly	Lys	Leu	Lys	Glu	Ala	Ile	288
				85			90			95					

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Lys	Lys	Ile	Gln	Ile	Ile	Thr	Asp	Lys	Asp	Cys	Lys	Glu	Asn	Glu	336
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Gln	Gln	Cys	Leu	Phe	Leu	Glu	Gly	Val	Cys	Ser	Lys	Glu	Leu	Lys	Asp	384
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Asp	Cys	Asn	Thr	Leu	Arg	Asn	Lys	Cys	Tyr	Gln	Lys	Arg	Asp	Lys	432
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Val	Ala	Glu	Glu	Val	Leu	Leu	Arg	Ala	Leu	Arg	Ser	Asp	Leu	Asn	Gly	480
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Ser	Val	Ile	Cys	Glu	Lys	Leu	Lys	Glu	Ile	Cys	Pro	Val	Met	Gly	528
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Arg	Glu	Ser	Asp	Glu	Leu	Thr	Asn	Leu	Cys	Leu	Asn	Gln	Lys	Glu	Thr	576
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Cys	Lys	Asn	Ile	Leu	Ile	Glu	Lys	Asp	Lys	Lys	Cys	Gly	Thr	Leu	Lys	624
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Thr	Asp	Val	Ser	Ala	Ala	Leu	Gly	Ser	Phe	Lys	Lys	Glu	Thr	Cys	Leu	672
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gct aca ata gca gag gat ata ggg ctg gaa gag ttt tat aag aag gta Ala Thr Ile Ala Glu Asp Ile Gly Leu Glu Glu Phe Tyr Lys Lys Val 275 280 285	864
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aga tat tgt aca gta gcg gga aac gta aat aat gcg tca atc agt ggc Arg Tyr Cys Thr Val Ala Gly Asn Val Asn Asn Ala Ser Ile Ser Gly 725 730 735	2208
tta tgc aaa gct aac acc aag gat aac tct gga aag agt gat gag gat Leu Cys Lys Ala Asn Thr Lys Asp Asn Ser Gly Lys Ser Asp Glu Asp 740 745 750	2256
gct aga aag gaa ctc tgt gag aaa tta gtg aaa gaa gtg gaa gaa cag Ala Arg Lys Glu Leu Cys Glu Lys Leu Val Lys Glu Val Glu Glu Gln 755 760 765	2304
tgc aaa gca tta cca aca gaa tta gga caa ccg gca gct gat cta aaa Cys Lys Ala Leu Pro Thr Glu Leu Gly Gln Pro Ala Ala Asp Leu Lys 770 775 780	2352
aaa gat tat aag aca tat gag gaa ctt aag aaa cgt gca gag gaa gca Lys Asp Tyr Lys Thr Tyr Glu Glu Leu Lys Lys Arg Ala Glu Glu Ala 785 790 795 800	2400
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gtt aag gat gta tcc gta aca gaa tta gaa gct aaa gca ttt gat ttg Val Lys Asp Val Ser Val Thr Glu Leu Glu Ala Lys Ala Phe Asp Leu 850 855 860	2592
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Gln Pro Ala Lys Ala Ala Arg Leu Leu Thr His Asp Leu Arg Met Lys
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 Asn Arg Leu Gly Thr Thr Glu Ile Leu Lys Gln Val Leu Leu Asp Glu
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 His Lys Asp Thr Leu Lys Asp Gln Glu Ser Cys Val Lys Tyr Leu Lys
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 770 775 780
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 Met Asn Lys Ser Ser Leu Val Leu Ser Leu Ile Lys Lys Asn Glu Ser
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Ala	Ala	Glu	Val	Phe	Gly	Arg	Tyr	Val	Asp	Leu	Lys	Glu	Arg	Cys	Asn
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Glu	Val	Cys	Lys	Lys	Ile	Asn	Lys	Ala	Cys	Arg	Asn	Leu	Lys	Pro	Leu
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Glu	Val	Lys	Pro	His	Glu	Thr	Val	Thr	Glu	Ser	Thr	Thr	Thr	Thr	Thr
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Leu	Gln	Thr	Thr	Asp	Thr	Trp	Val	Thr	Gln	Thr	Ser	Thr	His	Thr	Ser
945															960
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980															990
Ala	Gly	Asp	Val	Lys	Pro	Ser	Glu	Gly	Leu	Arg	Met	Ser	Gly	Trp	Asn
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Thr His Thr Ser Thr Ser Thr Thr Ser Thr Val Thr Ser Arg Ile															
20	25	30													
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